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ELAPHIDION VILLOSUM, FAB.

BY JOHN HAMILTON, M. D., ALLEGHENY, PA.

The account of this insect given by the early fathers of Economic Entomology is so charming that it seems almost profane to disturb a history accepted by most of their credulous offspring with unquestioning faith. Its wonderful habits and supra-rational instincts have been stock in trade ever since, and, like the fiction of the fly walking on glass by a sucker arrangement of its feet, is likely to hold its place in paste and scissor literature for all time to come.

Divested of all romance and imagination, and descending to facts, the observations of Professor Peck, Fitch and Harris may be reduced to this. In the month of July the parent lays the eggs on the limbs, or in the axil of a leaf near the end of the twigs of that year's growth of various species of oak, and perhaps other trees. After hatching, the young larva (in the latter case) penetrates to the pith and devours it downwards till the woody base is reached, and so onward to the centre of the main limb; here it eats away a considerable portion of the inside of the limb, and then plugging the end of the burrow, which it excavates towards the distal end, eventually falls to the ground with the limb, which being weakened, is broken off by the high autumnal winds. They exist here either as larvæ or pupæ till spring, and emerge in June as perfect beetles. Time, one year, though not so stated in words.

The account given in detail below is so different from the above, that were the identity of the individuals not established by actual comparison and by recognized authority, it might well be asserted I had given an account of some other *Elaphidion*.

April, 1883, I procured a barrel of hickory limbs from a tree girdled early in 1882; the limbs were from one-half to one inch in diameter. Very few things developed from them that season; but the next (1884) quite a number of species came forth—*Clytanthus ruricola* and *albofasciatus*, *Neoclytus luscus* and *erythrocephalus*, *Stenosphenus notatus*, etc.

Many larvæ of some Cerambycide continued to work on under the bark ; late in the fall I observed the most of these had penetrated the wood, but some remained under the bark till April and May of the next year (1885). The most of the beetles appeared during the first two weeks of June, though individuals occurred occasionally till September. A few larvæ were still found at work, but by October they, likewise, had bored into the wood and appeared as beetles the next June (1886). The normal period of metamorphosis is therefore three years, but in individuals it may be retarded to four or more years.

At the present writing (June 5th) these beetles are issuing in great numbers from a barrel of hickory limbs obtained in April, 1885, from a tree deadened in January, 1884, thus verifying the first observation.

How the larvæ get under the bark could not be ascertained. When first examined, in April, they were from 4 to 5 m.m. long ; they ate the wood under the bark, following its grain, and packed their burrow solidly with their dust. Their growth and progress were both slow, for by the next April they had scarcely more than doubled in length, and had not traveled more than from four to six inches during the year ; but after July they developed an enormous appetite, and consumed the wood for at least an inch in length, and often entirely around the limb, ejecting their castings through holes made in the bark. When full fed, they bore obliquely an oval hole into the wood, penetrating it from four to ten inches. The larva then packs the opening with fine castings and enlarges a couple of inches of the interior of the burrow by gnawing off its sides a quantity of coarse fibre, in which it lies, after turning its head to the entrance. When about to become a pupa (I witnessed the process), the skin ruptures on the dorsum of three or four segments next the head ; the head of the pupa appears, and after about half an hour's wriggling the whole body is divested of its covering. To the observer the pupa appears to crawl out of the skin, but in fact the skin with the large mandibles is forced backwards by the alternate extension and contraction of the segments, assisted materially by the fibre that surrounds it. After its soft body hardens, the same movements free it from the fibre, some being shoved in advance of the head, and some posteriorly, the exuviae being often found at the distal end of the hole.

The time spent in the pupal state is indefinite, and does not seem to concern greatly the time of the appearance of the beetle. Sticks split open at different periods from December till March contained larvæ and

pupæ about equally, but no developed beetles. A larva that I observed to go into the wood in April appeared as a beetle among the first of such as had presumably pupated in the fall.

The number of these beetles obtained that and the present season was great, and afforded a good opportunity to observe individual variations, and they do differ greatly. In length from 8 to 18 m.m.; in pubescence, some being nearly naked and unicolored, others having it longer and condensed into spots or almost vittate; some being quite slender and elongate, while others are short and broad; the surface of the elytra is mostly uniform, but in some, especially such as are narrow and elongated, one or two costæ are more or less evident.

Now, although this account differs so widely from that given by Mr. Fitch, still the beetles are the same. Unfortunately I have never been able to find any pruned oak limbs from which to obtain the insect myself, but I have a good set from Mr. Blanchard, of Mass., presumably from the oak, which are identical. Through the kindness of Mr. F. Clarkson, I have a set of those described by him in the CAN. ENT., vol. 17, p. 188, from oak limbs, and which became imagos in November, and there is no perceptible difference. Dr. Geo. H. Horn says, "they are the same."

To identify *Elaphidion parallelum* had always been a puzzle to me, and I once thought I had a real set; I obtained it about a dozen times by exchange, but could never be satisfied that the specimens received were not pauperized, or peculiar individuals of *E. villosum*. On comparing my hickory insects with all the descriptions of *E. villosum* and *parallelum* and their several synonyms, as far as I possess them, it was easy to pick out sets that would answer satisfactorily all their requirements, and I became satisfied that *E. parallelum* could not be separated.

An inquiry of Dr. Geo. H. Horn elicits the following note and kind permission to use it:

"Regarding the two species of *Elaphidion* (*villosum* and *parallelum*) of which you write, I can only say that my opinion, based on the series in my cabinet and an examination of those in the cabinet of Dr. Leconte, is that they are inseparable. The slight differences, referred to by Dr. Leconte, in the last ventral segment of the males, are not real but dependent on the angle at which they are seen." The differences referred to are that in *E. villosum* the last ventral segment of the male is rounded, while in *parallelum* it is emarginate. The only other structural difference mentioned by Dr. Leconte is,

"Prothorax scarcely longer than wide—*villosum*.

"Prothorax distinctly longer than wide —*parallelum*."

From the insects before me from the hickory, it is easy to pick out some with the thorax fully one-fourth wider than long, and others with it one-fourth longer than wide, but they are brought together so insensibly by intermediates, that where the proper separation into species should begin it is impossible to decide. The same may be said of the differences in elongation, narrowness and pubescence; and I can find no basis for retaining *parallelum* as even a racial or varietal name.

I trust the foregoing may stimulate such as have opportunity to investigate the habits of this interesting beetle more thoroughly. I mention some of the points that require clearing up. First, the length of time occupied in the metamorphosis of such as breed in the branches of living trees. One year is certainly an error, as it is opposed to the known history of any other Cerambycide having a similar habit. Second, whether the falling of the limb is not accidental, the majority containing larvæ not being weakened enough to break. Third, whether the end of the limb remaining on the tree does not contain the insect equally with that which falls—points that might be determined by cutting down a tree in autumn from which limbs had been pruned. Fourth, to make a collection for comparison from each species of tree infested.

Besides the accounts of Professor Peck, Fitch and Harris, the following bibliography may be noticed:

Haldeman—Trans. Am. Phil. Soc., vol. 10, p. 34.

Larva feeds on the living [?] wood of oak, hickory and chestnut; also dead Abies.

Riley—American Ent., vol. 2, p. 60; *ib.* vol. 3, p. 239.

Larva bores in plum and apple twigs, and in dry grape cane, Missouri Rep., 3, p. 6. Bores into and prunes the limbs of the apple. *ib.* 4, p. 54. Bred abundantly from injured grape stems.

Rathvon—U. S. Agricultural Rep., 1861, p. 615.

Merely a synopsis of Fitch's account.

Packard, jr.—Bul., No. 7, p. 30. U. S. Entomological Commission. Scissored from Fitch in full.

Clarkson—Can. Ent., vol. 17, p. 188, and vol. 19, p. 31.

Discovers that the insect completes its metamorphosis in the fall and

early winter, in oak limbs, and takes issue with Peck, Fitch and Harris on several points.

Townsend, Can. Ent., vol. 18, p. 12.

Thinks Mr. Clarkson's discovery the exception, and not the rule, in the time of metamorphosis.

DESCRIPTIONS OF NEW SPECIES OF NORTH AMERICAN HETEROCERA, WITH NOTES.

BY HENRY EDWARDS.

FAM. ÆGERIADÆ.

FATUA PALMII, n. sp.

Allied to *F. denudata*, but differing greatly in important particulars. Fore wings are bright shining seal-brown, deep orange along the costa for the basal half. At the middle of the wing at base is a narrow denuded space, and the internal angle is also devoid of scales, but much more narrowly so than in *denudata*. The transparent space is golden yellow in shade. Lower wings transparent golden yellow, with very bright but dark opalescent reflection. The margin and spot at the extremity of cell dark brown. Antennæ bluish black, orange brown at the base. Head, disk of thorax, and the upper portion of the abdominal segments, black. Eyes black, palpi with black at their base. Front of head, collar, sides and base of thorax, posterior edges of abdominal segments bright orange. Feet and legs wholly orange without any black bands.

Exp. wings 45 m.m. Length of body 22 m.m. 1 ♀. Enterprise, Florida. Taken by Mr. C. Palm, to whom I dedicate the species.

FAM. BOMBYCIDÆ.

LIMACODES BEUTENMUELLERI, n. sp.

Primaries rich chestnut brown, very glossy and mottled with blue metallic scales. Across the median space, and extending along internal margin to base is a deep fawn brown shade enclosing darker shades, and giving a clouded appearance to the wing. The apical part of the margin and the fringe pale fawn drab, passing into darker shade at the internal angle. Secondaries smoky brown, margins paler. Beneath